

## CLAIMS

1. (Currently Amended) A method of enhancing scan resolution, suitable for use in a scanner with an optical sensor, the optical sensor having a detecting cell that can detect a range comprising a predetermined number of two or more original pixels, the method comprising:

scanning a smooth image region to obtain a smooth image data, wherein the smooth image region comprises at least the predetermined number of original pixels, and wherein the smooth image region comprises a generally uniform brightness;

scanning a range of multiple original pixels, wherein one or more of the scanned original pixels correspond to a document; and

processing at least one of the scanned images original pixels corresponding to the obtained by scanning a document, at least in part, according to the smooth image data and the other scanned original pixels in the range.

2. (Original) The method according to claim 1, wherein the smooth image data is obtained prior to scanning the document.

3. (Currently Amended) The method according to claim 2 wherein processing scanned images obtained by scanning a document further comprises:

obtaining a calculated smooth brightness of the original pixels corresponding to the smooth image data; and

using a calculated brightness corresponding to the original pixels with the predetermined number minus one in the smooth image region as a standard to calculate the calculated brightness corresponding to original pixels of the document.

4. (Previously Presented) The method according to claim 3, wherein when there are original pixels with a pre-pixel number prior to the original pixels to be calculated, calculating the calculated brightness corresponding to the original pixels in the document comprises:

comparing the brightness of a scanned pixel to the brightness of the original pixels with a number equal to the predetermined number minus one prior to the original

pixels to be calculated when the pre-pixel number is greater than or equal to the predetermined number minus one, so as to obtain the calculated brightness of the original pixels to be calculated; and

comparing the brightness of the scanned pixels to the brightness of the calculated brightness corresponding to the original pixels prior to the original pixels to be calculated, and the smooth calculated brightness of the original pixels with the predetermined number minus the pre-pixel number and minus one when the pre-pixel is smaller than the predetermined number minus one, so as to obtain the calculated brightness of the original pixels to be calculated.

5. (Previously Presented) The method according to claim 3, wherein calculating the calculated brightness corresponding to the original pixels in the document comprises performing a real time calculation while scanning the document.

6. (Previously Presented) The method according to claim 3, wherein calculating the calculated brightness corresponding to the original pixels in the document comprises calculating after scanning the document.

7. (Currently Amended) A The method according to claim 1 of enhancing scan resolution, suitable for use in a scanner with an optical sensor, the optical sensor having a detecting cell that can detect a range comprising a predetermined number of two or more original pixels, the method comprising:  
scanning a smooth image region to obtain a smooth image data, wherein the smooth image region comprises at least the predetermined number of original pixels, and wherein the smooth image region comprises a generally uniform brightness; and  
processing scanned images obtained by scanning a document according to the smooth image data, wherein the smooth image data is obtained after scanning the document.

8. (Previously Presented) The method according to claim 7, wherein obtaining a scanned pixel while scanning the document comprises:

obtaining a calculated smooth brightness of the corresponding original pixels from the scanned pixels of the smooth image data; and

using a corresponding calculated brightness to the original pixels with the predetermined number minus one in the smooth image region as a standard to calculate a calculated brightness corresponding to original pixels of the document.

9. (Original) The method according to claim 8, wherein when there are original pixels with a pre-pixel number prior to the original pixels to be calculated, calculating the calculated brightness corresponding to the original pixels in the document comprises:

comparing the brightness of a scanned pixel to the brightness of the original pixels with a number equal to the predetermined number minus one prior to the original pixels to be calculated when the pre-pixel number is greater than or equal to the predetermined number minus one, so as to obtain the calculated brightness of the original pixels to be calculated; and

comparing the brightness of the scanned pixels to the brightness of the calculated brightness corresponding to the original pixels prior to the original pixels to be calculated, and the smooth calculated brightness of the original pixels with the predetermined number minus the pre-pixel number and minus one when the pre-pixel is smaller than the predetermined number minus one, so as to obtain the calculated brightness of the original pixels to be calculated.

10. (Previously Presented) A method of enhancing scan resolution, suitable for use in a scanner with an optical sensor, the optical sensor having a detecting cell that can detect a range comprising a predetermined number of two or more original pixels, the method comprising:

scanning a smooth image region to obtain a smooth image data, wherein the smooth image region comprises at least the predetermined number of original pixels and a generally uniform brightness; and

processing scanned images obtained by scanning a document according to the smooth image data, wherein processing the scanned images comprises:

obtaining a calculated smooth brightness of the original pixels corresponding to scanned pixels of the smooth image data; and  
using a calculated brightness corresponding to the original pixels with the predetermined number minus one in the smooth image region as a standard to calculate the calculated brightness corresponding to original pixels of the document.

11. (Previously Presented) The method according to claim 10, wherein the smooth image data is obtained prior to scanning the document.

12. (Previously Presented) The method according to claim 10, wherein when there are original pixels with a pre-pixel number prior to the original pixels to be calculated, calculating the calculated brightness corresponding to the original pixels in the document comprises:

comparing the brightness of a scanned pixel to the brightness of the original pixels with a number equal to the predetermined number minus one prior to the original pixels to be calculated when the pre-pixel number is greater than or equal to the predetermined number minus one, so as to obtain the calculated brightness of the original pixels to be calculated; and

comparing the brightness of the scanned pixels to the brightness of the calculated brightness corresponding to the original pixels prior to the original pixels to be calculated, and the smooth calculated brightness of the original pixels with the predetermined number minus the pre-pixel number and minus one when the pre-pixel is smaller than the predetermined number minus one, so as to obtain the calculated brightness of the original pixels to be calculated.

13. (Previously Presented) The method according to claim 10, wherein calculating the calculated brightness corresponding to the original pixels in the document comprises performing a real time calculation while scanning the document.

14. (Previously Presented) The method according to claim 10, wherein calculating the calculated brightness corresponding to the original pixels in the document comprises calculating after scanning the document.

15. (Previously Presented) The method according to claim 10, wherein the smooth image data is obtained after scanning the document.

16. (Currently Amended) A method comprising:  
scanning a smooth image region with a generally uniform brightness;  
obtaining a standard brightness from the smooth image region; and  
scanning a predetermined number of multiple original pixels, wherein one or more of the scanned original pixels correspond to a second image region; and  
determining a calculated brightness for at least one of the scanned original pixels corresponding to the a portion of a second image region based at least in part on the standard brightness and the other scanned original pixels in the predetermined number of multiple original pixels.

17. (Previously Presented) The method according to claim 16, wherein the second image region comprises at least a portion with a non-uniform brightness.

18. (Currently Amended) The method according to claim 16, wherein the scanning of the smooth image region with a the generally uniform brightness is performed prior to scanning the second image region.

19. (Currently Amended) The method according to claim 16, wherein the scanning of the smooth image region with a the generally uniform brightness is performed after scanning the second image region.

20. (Previously Presented) A storage medium comprising one or more instructions thereon that, if executed, result in:

enhancing scan resolution in a scanner with an optical sensor having a detecting cell that can detect a range including a predetermined number of two or more original pixels, wherein enhancing scan resolution comprises:

scanning a smooth image region to obtain a smooth image data, wherein the smooth image region comprises at least the predetermined number of original pixels and a generally uniform brightness; and

processing scanned images obtained by scanning a document according to the smooth image data, wherein processing the scanned images comprises:

obtaining a calculated smooth brightness of the original pixels

corresponding scanned pixels of the smooth image data; and

using a calculated brightness corresponding to the original pixels with the predetermined number minus one in the smooth image region as a standard to calculate the calculated brightness corresponding to original pixels of the document.

21. (Currently Amended) The ~~article~~ storage medium of claim 20, wherein the smooth image data is obtained prior to scanning the document.

22. (Currently Amended) The ~~article~~ storage medium of claim 20, wherein when there are original pixels with a pre-pixel number prior to the original pixels to be calculated, the instruction, if executed, further ~~result~~ results in calculating the calculated brightness corresponding to the original pixels in the document comprising:

comparing the brightness of a scanned pixel to the brightness of the original pixels with a number equal to the predetermined number minus one prior to the original pixels to be calculated when the pre-pixel number is greater than or equal to the predetermined number minus one, so as to obtain the calculated brightness of the original pixels to be calculated; and

comparing the brightness of the scanned pixels to the brightness of the calculated brightness corresponding to the original pixels prior to the original pixels to be calculated, and the smooth calculated brightness of the original pixels with the predetermined number minus the pre-pixel number and minus one when the pre-pixel is

smaller than the predetermined number minus one, so as to obtain the calculated brightness of the original pixels to be calculated.

23. (Currently Amended) The ~~article~~ storage medium of claim 20, wherein calculating the calculated brightness corresponding to the original pixels in the document comprises performing a real time calculation while scanning the document.

24. (Currently Amended) The ~~article~~ storage medium of claim 20, wherein calculating the calculated brightness corresponding to the original pixels in the document comprises calculating after scanning the document.

25. (Currently Amended) The ~~article~~ storage medium of claim 20, wherein the smooth image data is obtained after scanning the document.

26. (Currently Amended) A computer-readable storage medium comprising one or more instructions thereon that, if executed, result in:

scanning a smooth image region with a generally uniform brightness;  
obtaining a standard brightness from the smooth image region; ~~and~~  
scanning a predetermined number of multiple original pixels, wherein one or more of the scanned original pixels correspond to a second image region; and  
determining a calculated brightness for at least a portion of ~~a~~ the second image region based at least in part on the standard brightness and one or more of the scanned original pixels in the predetermined number of multiple original pixels.

27. (Previously Presented) The computer-readable storage medium of claim 26, wherein the second image region comprises at least a portion with a non-uniform brightness.

28. (Currently Amended) The computer-readable storage medium of claim 26, wherein the scanning of the smooth image region with ~~a~~ the generally uniform brightness is performed prior to scanning the second image region.

29. (Currently Amended) The computer-readable storage medium of claim 26, wherein the scanning of the smooth image region with a the generally uniform brightness is performed after scanning the second image region.

Claims 30-35. (Cancelled)

36. (Currently Amended) An apparatus, comprising:  
means for scanning a smooth image region with a generally uniform brightness;  
means for obtaining a standard brightness from the smooth image region; ~~and~~  
means for scanning a range of multiple original pixels, wherein one or more of the scanned original pixels correspond to a second image region; and  
means for determining a calculated brightness for at least one of the scanned original pixels corresponding to the ~~a portion of a~~ second image region based at least in part on the standard brightness and the other scanned original pixels in the range.

37. (Currently Amended) The apparatus of claim 36, wherein the means for determining ~~of the~~ calculated brightness for at least a portion of a the second image region based at least in part on the standard brightness ~~comprise~~ means for determining ~~of the~~ calculated brightness for at least a portion of the second image region having a non-uniform brightness.

38. (Currently Amended) The apparatus of claim 36, wherein the means for scanning of the smooth image region with a the generally uniform brightness ~~comprise~~ means for scanning of the smooth image region with a uniform brightness prior to scanning the second image region.

39. (Currently Amended) The apparatus of claim 36, wherein the means for scanning of the smooth image region with a the generally uniform brightness ~~comprise~~ means for scanning of the smooth image region with a uniform brightness after scanning the second image region.



40. (Currently Amended) A system scanner, comprising:  
~~a smooth image region with a generally uniform brightness;~~  
a sensor capable of scanning ~~the~~ a smooth image region with a generally uniform brightness and scanning a range of multiple original pixels, wherein one or more of the scanned original pixels correspond to a second image region; and wherein the  
a scanner is capable of obtaining a standard brightness from the smooth image region; ~~and~~ wherein the scanner is capable of determining a calculated brightness for at least one of the scanned original pixels corresponding to the a portion of a second image region based at least in part on the standard brightness and the other scanned original pixels in the range.

41. (Currently Amended) The system scanner of claim 40, wherein the scanner is capable of determining the calculated brightness for at least a portion of the second image region having a non-uniform brightness.